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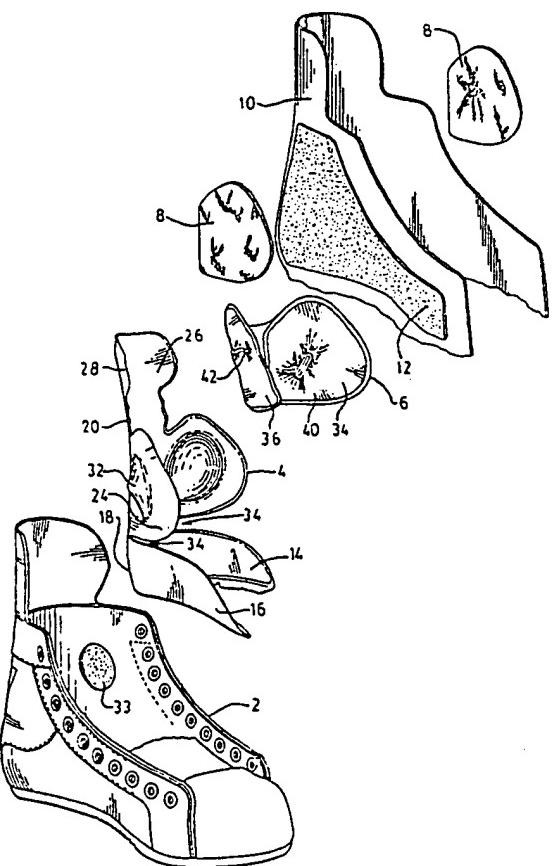
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(54) Title: SKATE BOOT CONSTRUCTION WITH INTEGRAL PLASTIC INSERT

## (57) Abstract

The skate boot has a one-piece plastic ankle and heel counter insert (4), positioned between the various layers which make up the skate boot. In sequence from outside to inside, the boot includes a conventional outer (2), the one-piece plastic insert, suitable cushioning (6, 8), and a lining (10). The insert has a heel counter portion which is generally U-shaped and which cups around the heel area from along the lateral side, across the heel, and along the medial side, and an integral ankle portion which extends upwardly from the heel area of the heel counter portion and which includes forwardly projecting wing portions which cup around the ankle area from over the area of the lateral malleolus, across the rear and over the area of the medial malleolus. Preferably, the plastic insert extends up most of the height of the back of the boot, and includes lateral and medial cuff portions which extend partially forward along the sides of the skater's upper ankle. The one-piece plastic insert provides improved performance and rigidity over conventional separate inserts, while avoiding the tendency of the ankle portion of the skate boot to slump down onto the heel portion with time.



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SKATE BOOT CONSTRUCTION WITH INTEGRAL PLASTIC INSERT

TECHNICAL FIELD

This invention relates to a boot construction, especially for ice skates or in-line roller skates, but  
5 not necessarily limited to same.

In skate boots, there are somewhat conflicting requirements for rigidity and comfort which, particularly in recent years, have led to increasingly sophisticated boot constructions in the perhaps never-ending quest for  
10 the "perfect" skate. In high-end skates such as those worn by professional hockey players, the twin requirements of rigidity and comfort are magnified. Performance must be optimized, and frequent wearing demands comfort, not just for the sake of comfort itself,  
15 but also to prevent blistering or other forms of injury to the foot (short term or long term).

BACKGROUND ART

One means which has been used in skates to increase rigidity is to employ plastic ankle inserts and  
20 heel counter inserts, sewn in between the layers of various materials which make up the boot. When skates are relatively new, this is fairly effective both in terms of rigidity and comfort. After considerable use of the skate, however, the leather and other materials  
25 naturally soften and become less rigid from repeated flexing, with the result that the upper ankle portion of the boot tends to slump down onto or over the heel counter, typically creating a ridge on the inside of the skate. This ridge bears against the Achilles' tendon,  
30 and thus creates a pressure point which results in decreased comfort and potential for blistering or other injury. The present invention is aimed specifically at

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avoiding that problem, and generally at providing an improved skate boot.

DISCLOSURE OF THE INVENTION

In the invention, a one-piece plastic ankle and heel counter insert is employed, positioned between the various layers which make up the skate boot. In sequence from outside to inside, the boot includes a conventional outer, the plastic insert, suitable cushioning means, and a lining. The insert has a heel counter portion which is generally U-shaped and which cups around the heel area from along the lateral side, across the heel, and along the medial side, and an integral ankle area which extends upwardly from the heel counter portion and which includes forwardly projecting wing portions which cup around the ankle area from the lateral side, across the rear and along the medial side.

Preferably, the plastic insert extends up most of the height of the back of the boot, and includes lateral and medial cuff portions which extend partially forward around the skater's upper ankle.

Preferably, to permit flexing of the ankle with minimal restriction, slots are provided between the wing portions and the sides of the heel counter portion.

The concept of the invention, i.e. the use of a one-piece plastic insert where separate pieces have been used before, is quite simple. However, in practice this has been difficult to achieve, and does not appear to have been previously considered, since conventional boot manufacturing assembly sequences have had to be changed to accommodate insertion of the one-piece insert. It has therefore not been natural to try this approach, due to the process changes involved, and has required a change in approach and thinking.

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Further features of the invention will be described or will become apparent in the course of the following detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

5 In order that the invention may be more clearly understood, the preferred embodiment thereof will now be described in detail by way of example, with reference to the accompanying drawings, in which:

10 Fig. 1 is an exploded perspective view of the preferred embodiment of the skate boot;

Fig. 2 is a perspective view of the skate boot, cut open to show details of the construction;

15 Fig. 3 is a right side elevation of the skate, in cross-section, after positioning of the insert, but prior to positioning of the cushioning means and lining;

20 Fig. 4 is a right side elevation view of the skate, in cross-section, after positioning of the insert and the cushioning pack of flowable material, but prior to positioning of the neoprene rubber pad and of the lining, showing the lateral side of the insert and cushioning pack;

25 Fig. 5 is a left side elevation view of the skate, in cross-section, corresponding to Fig. 4 and showing the medial side of the insert and cushioning pack;

Fig. 6 is a right side elevation view of the skate, in cross-section, after positioning of the insert, the cushioning pack of flowable material and the neoprene rubber pad, but prior to positioning of the lining;

30 Fig. 7 is an elevation view of the cushioning pack laid flat;

Fig. 8 is a plan view of the cushioning pack; and

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Fig. 9 is a cross-sectional view of a portion of the cushioning pack, at 9-9 of Fig. 8.

All of the drawings are of a left skate.

BEST MODE FOR CARRYING OUT THE INVENTION

- 5 Referring to the drawings, the invention will now be described in greater detail. Fig. 1 shows the various components of the skate boot in exploded fashion. From the outside to the inside, the skate boot is made up of:
- 10 a typical skate boot outer 2, conventionally having various layers of leather, plastic, ballistic nylon and/or other materials portions sewn together; the plastic insert 4 of the present invention; cushioning means such as, preferably, a
- 15 cushioning pack 6 of flowable gel-like material which will conform to the particular individual's ankle shape, and neoprene rubber pads 8; and a soft material lining 10, preferably having a thin foam layer 12 bonded to the outside thereof.
- 20 The essence of the present invention resides in the one-piece plastic ankle / heel counter insert 4. It is made of a suitable plastic such as thermoplastic polyurethane, and is relatively thin (about 2.5 mm at its thickest central portions, thinning near the edges down
- 25 to zero) so as to not add too much weight to the skate. Because it is fairly thin, it is somewhat flexible, but nevertheless does add a fair amount of rigidity to the overall structure of the boot.
- The insert includes lateral and medial side
- 30 portions 14 and 16 which extend forward from the heel area 18; a rear ankle portion 20 extending upwardly from the heel area; lateral and medial wing portions 22 and 24 arranged to overlie the malleoli of the skater's

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ankle; and lateral and medial cuff portions 26 and 28 to wrap partially around the skater's upper ankle.

Preferably, in order to be as nearly anatomically correct as possible, the lateral and medial 5 wing portions include dished areas 30 and 32 to accommodate the malleoli. The boot outer 2 preferably includes recesses 33 to accommodate these dished areas.

To permit flexing of the ankle with minimal restriction, slots 34 preferably are provided between the 10 wing portions and the side portions 14 and 16.

The additional cushioning means preferably includes a cushioning pack 6 of flowable gel-like material which will conform to the particular skater's ankle shape. (One such material is that supplied by 15 Alden Laboratories, Inc. of Boulder, Colorado under its Flo trademark.) The preferred cushioning pack is shown in greater detail in Figs. 7-9, and includes lateral and medial gel pouches 34 and 36 defined between thin layers of plastic, preferably but not necessarily connected by 20 an integral neck portion 38. The cushioning pack may include lateral and medial closed areas 40 and 42, which approximate the path followed by the lateral and medial malleoli when the ankle is flexed, for even greater anatomical correctness and hence comfort and performance.

25 The cushioning pack preferably is overlaid by thin pads 8, of 1/8 inch neoprene rubber for example. This is followed by the soft material lining 10, such as a synthetic leather, the lining preferably having a thin foam layer 12 bonded to the outside thereof.

30 With the integral or one-piece construction of the insert 4, the ankle portion 20 cannot slump down onto the heel portion 18 with time, which is the problem in the prior art which this invention avoids. The blister-causing pressure point which often results once skates 35 have been used for a length of time is thus avoided.

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It will be appreciated that the above description relates to the preferred embodiment by way of example only. Certain variations on the invention will be obvious to those knowledgeable in the field, and such 5 obvious variations are within the scope of the invention as claimed, whether or not expressly described herein.

For example, it should be clearly appreciated that the invention is not restricted to the specific configuration of insert as illustrated herein. Many 10 variations in shape could be contemplated which would still employ the principle of this invention.

For example, as one example only, the slots 34 could be omitted, i.e. the wing portions could be directly connected to the heel portion. This would 15 restrict flexing of the ankle somewhat, and would therefore not be optimal, but would still be within the scope and spirit of the invention.

#### INDUSTRIAL APPLICABILITY

The invention provides an improved skate boot, 20 with better comfort and a longer effective life.

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CLAIMS:

1. A skate boot, comprising, all permanently secured in place:
  - an outer (2), configured and assembled to form
  - 5 a boot shape including a heel area (18) and an ankle area above said heel area, said heel and ankle areas having rear, lateral and medial areas;
  - cushioning means (6, 8) positioned inwardly from said outer; and
- 10 an inner lining (10) positioned inwardly from said outer and said cushioning means;
  - said boot being characterized by:
    - a one-piece plastic insert (4) positioned between said outer and said cushioning means, comprising
    - 15 a generally U-shaped heel counter portion cupped within said heel area, running from along said lateral area, across said rear area, and along said medial area, and an integral ankle portion extending upwardly from said rear area of said heel counter portion and including forwardly
    - 20 projecting lateral and medial wing portions (14, 16) which cup around said ankle area along said lateral area and said medial area respectively.
- 22 2. A skate boot as recited in claim 1, where said cushioning means comprises at least one pack (6) of flowable gel-like material.
- 24 3. A skate boot as recited in claim 2, where said cushioning means further comprises at least one resilient pad (8) positioned inwardly from and against said at least one pack.
- 26 4. A skate boot as recited in claim 1, where said wing portions and said heel counter portion are separated

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by a slotted area (34), whereby said insert does not substantially restrict flexing of a person's ankle while wearing the skate boot.

5. 5. A skate boot as recited in claim 1, where said lateral and medial wing portions extend forwardly sufficiently to overlie lateral and medial malleoli of the foot of a person wearing the skate boot, and where said wing portions are dished outwardly opposite said malleoli to approximate the contour of same.

10 10 6. A one-piece plastic insert for use in a skate boot, said skate boot comprising: an outer (2), configured and assembled to form a boot shape including a heel area and an ankle area above said heel area, said heel and ankle areas having rear, lateral and medial 15 areas; cushioning means (6, 8) positioned inwardly from said outer; and an inner lining (10) positioned inwardly from said outer and said cushioning means;

20 said one-piece plastic insert (4) being configured for insertion between said outer and said cushioning means, and comprising a generally U-shaped heel counter portion positionable within said heel area to run from along said lateral area, across said rear area, and along said medial area, and an integral ankle portion to extend upwardly from said rear area of said 25 heel counter portion and including forwardly projecting lateral and medial wing portions to cup around said ankle area along said lateral area and said medial area respectively.

7. 30 An insert as recited in claim 6, where said wing portions and said heel counter portion are separated by a slotted area (34), whereby said insert does not

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substantially restrict flexing of a person's ankle while wearing a skate boot incorporating the insert.

8. An insert as recited in claim 6, where said lateral and medial wing portions extend forwardly  
5 sufficiently to overlie lateral and medial malleoli of a person wearing a skate boot incorporating the insert, and where said wing portions are dished outwardly opposite said malleoli to approximate the contour of same.

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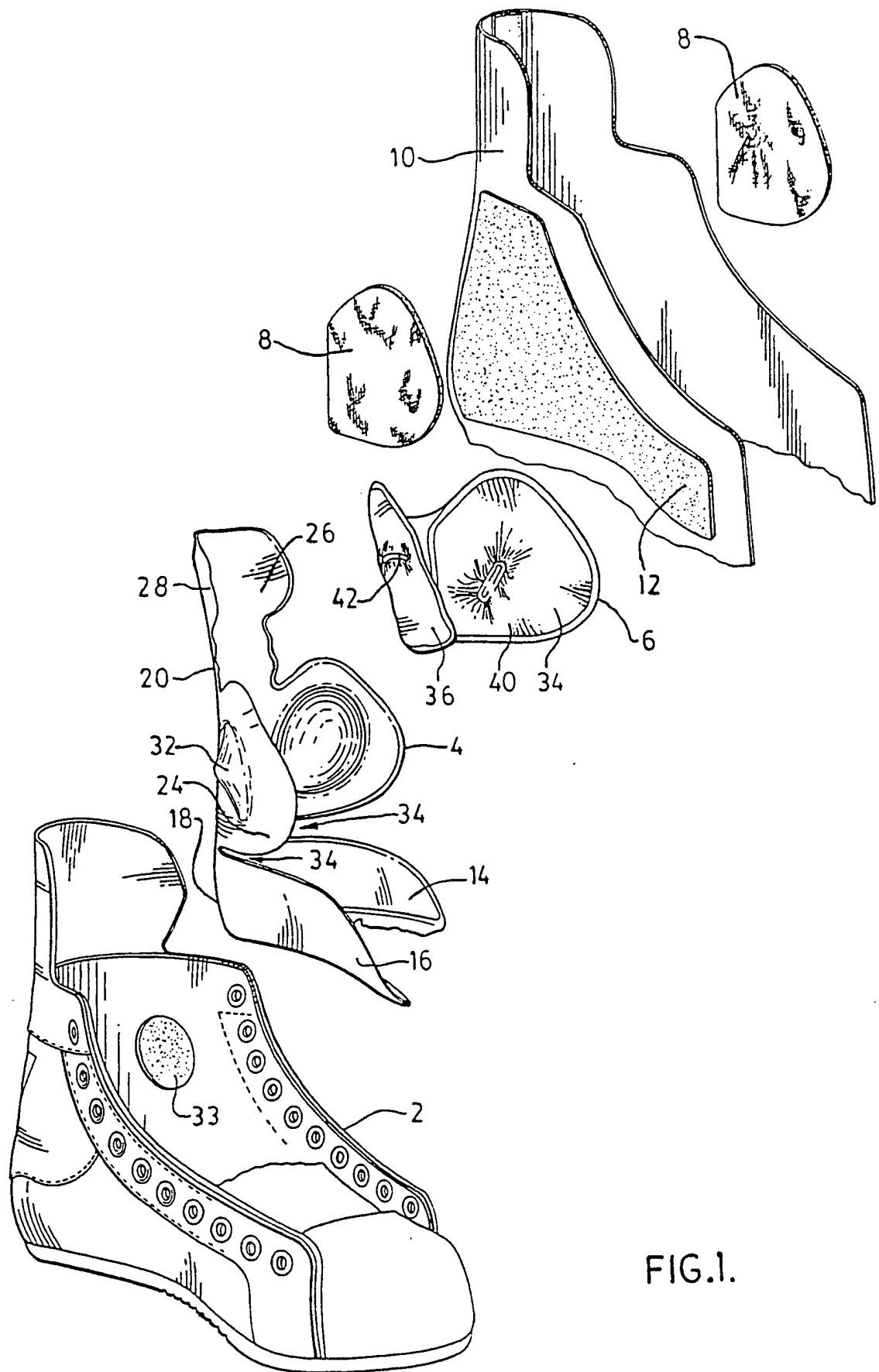


FIG. 1.

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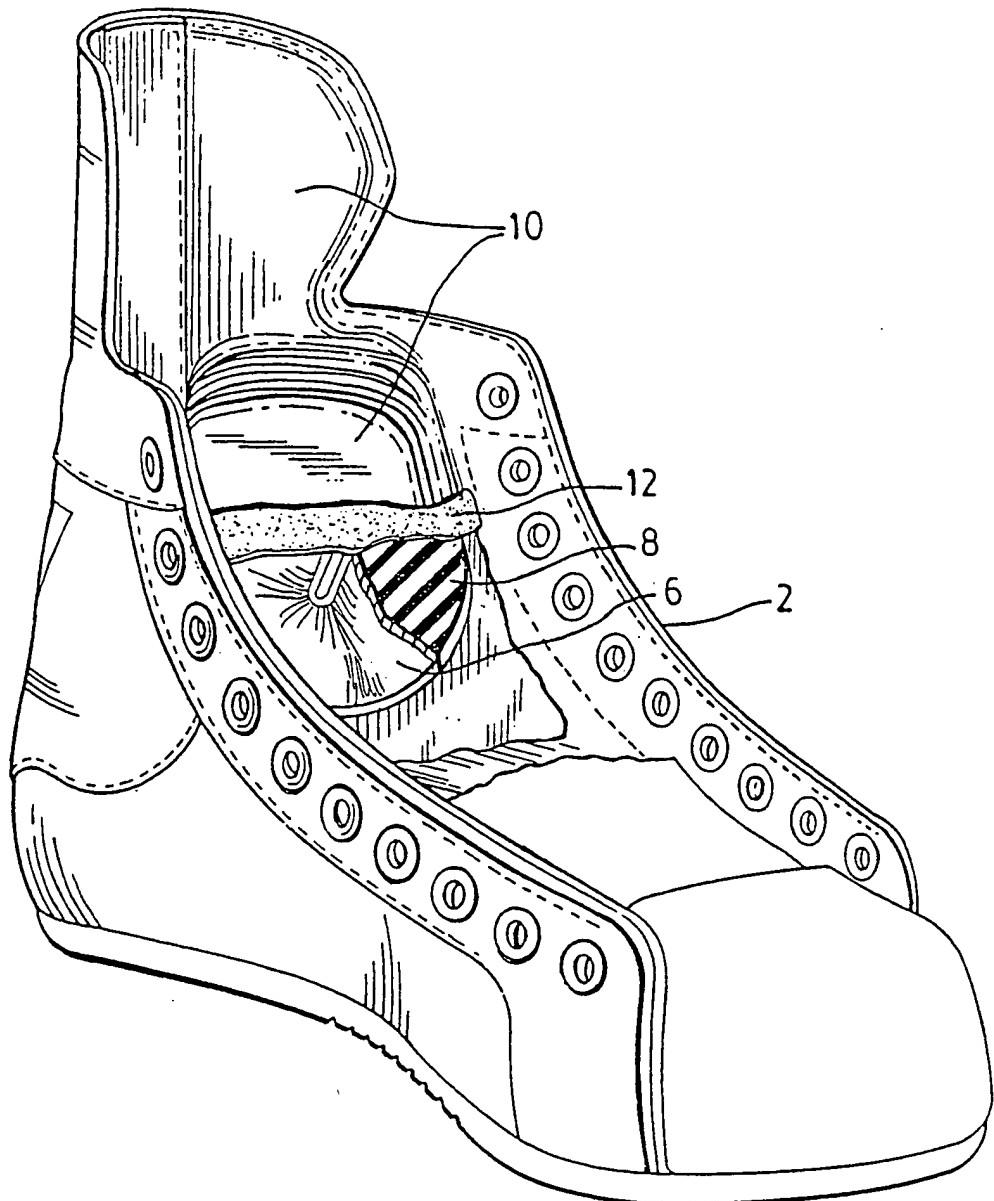


FIG.2.

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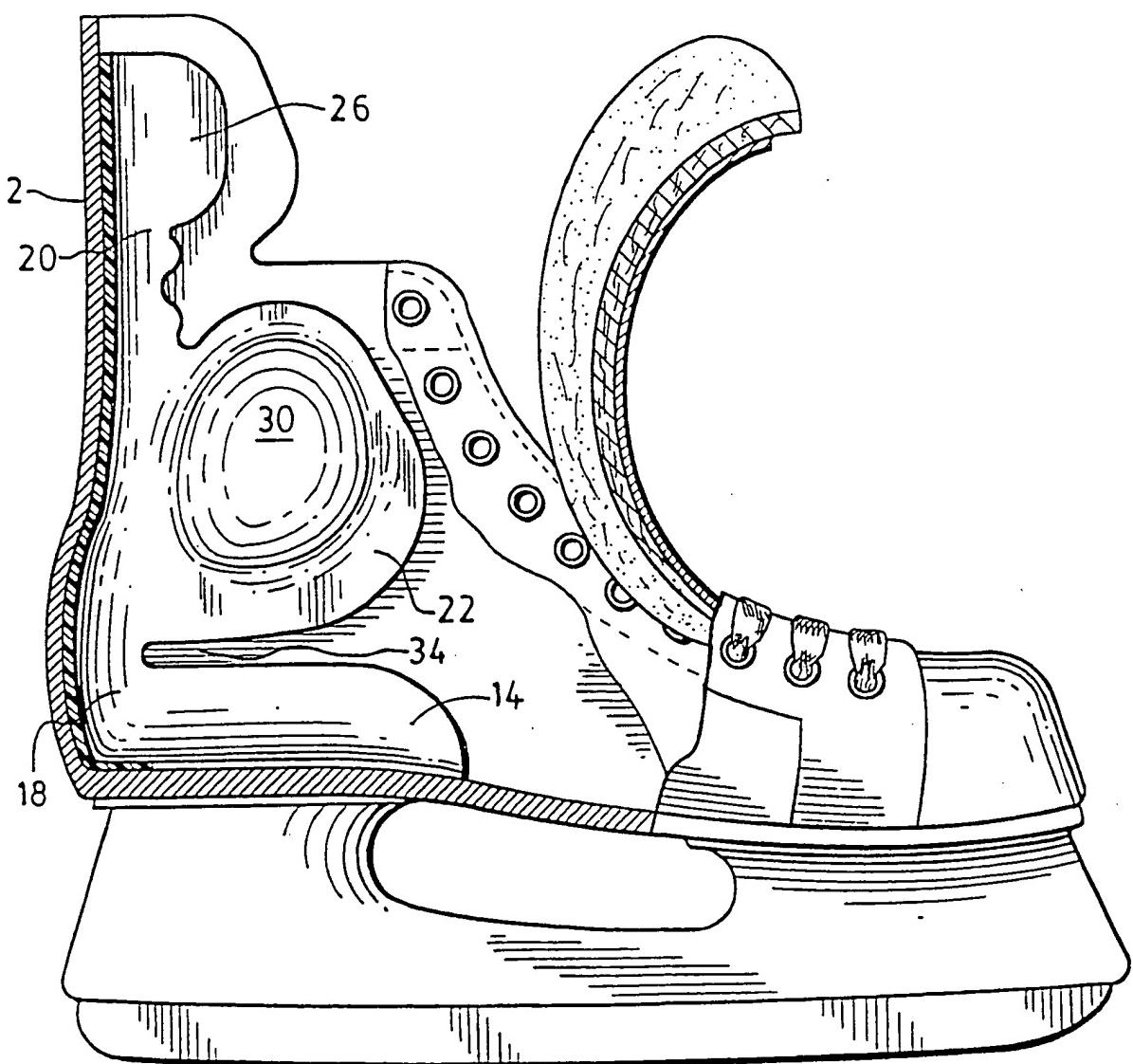


FIG.3.

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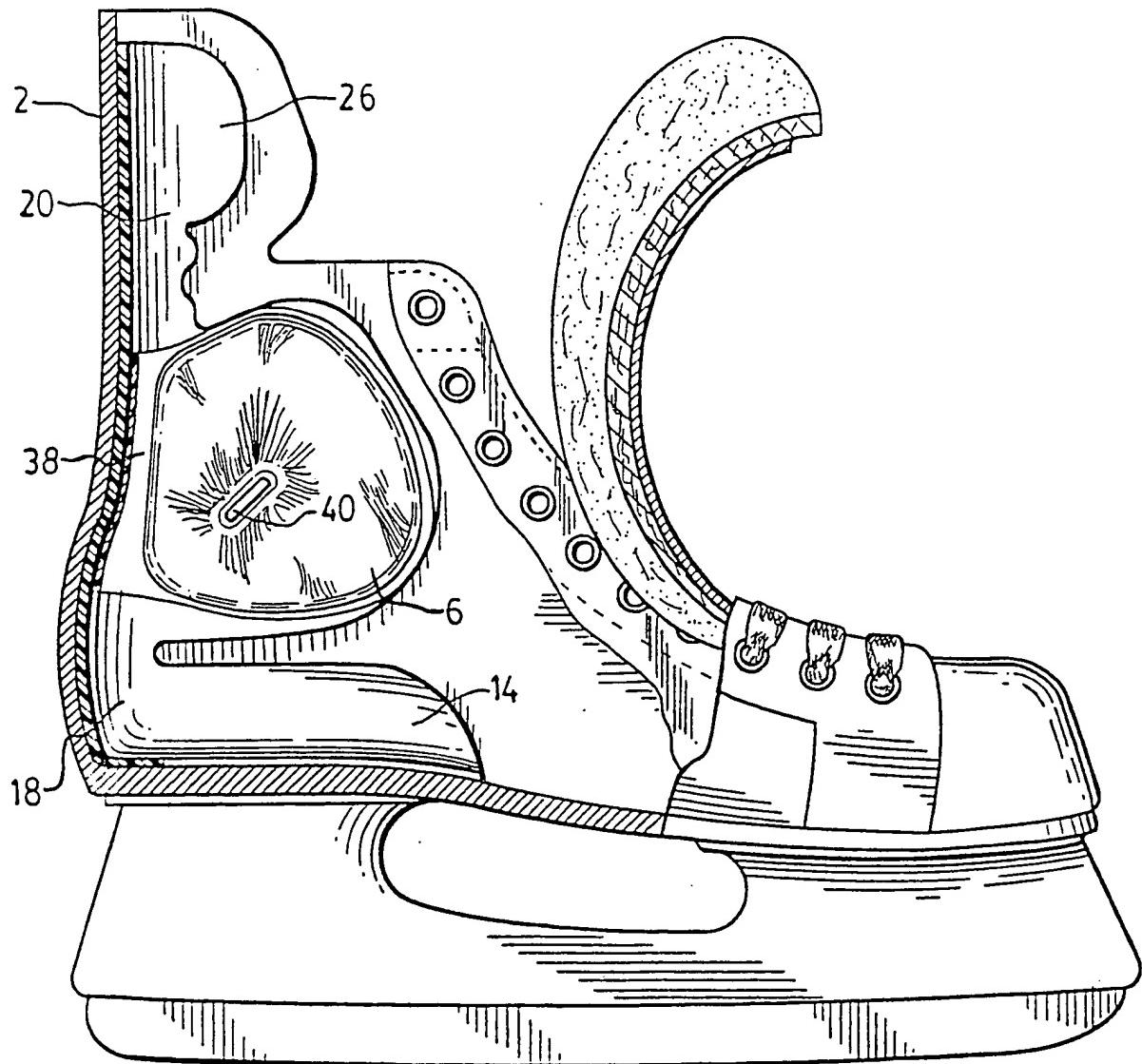


FIG.4.

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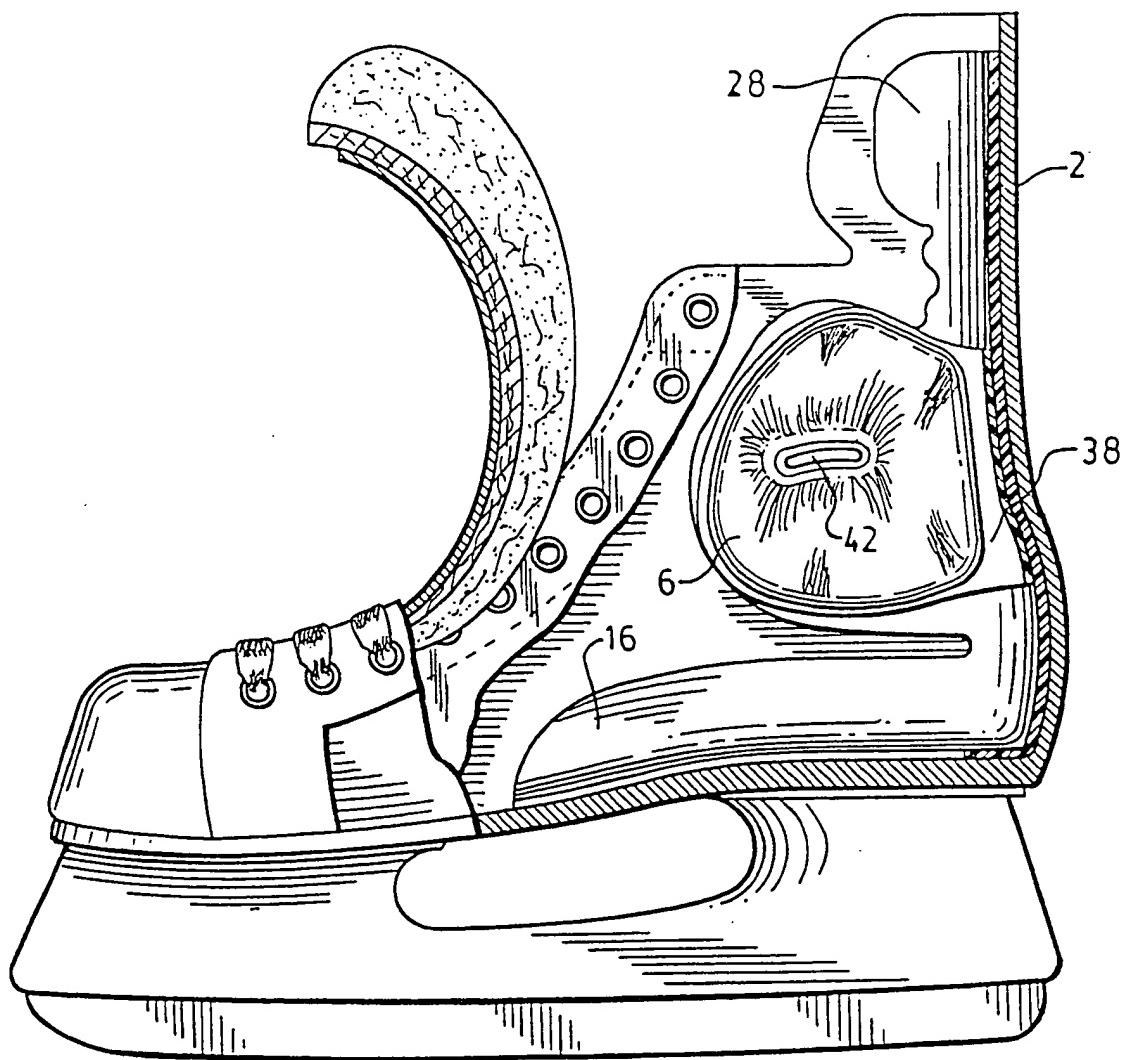


FIG. 5.

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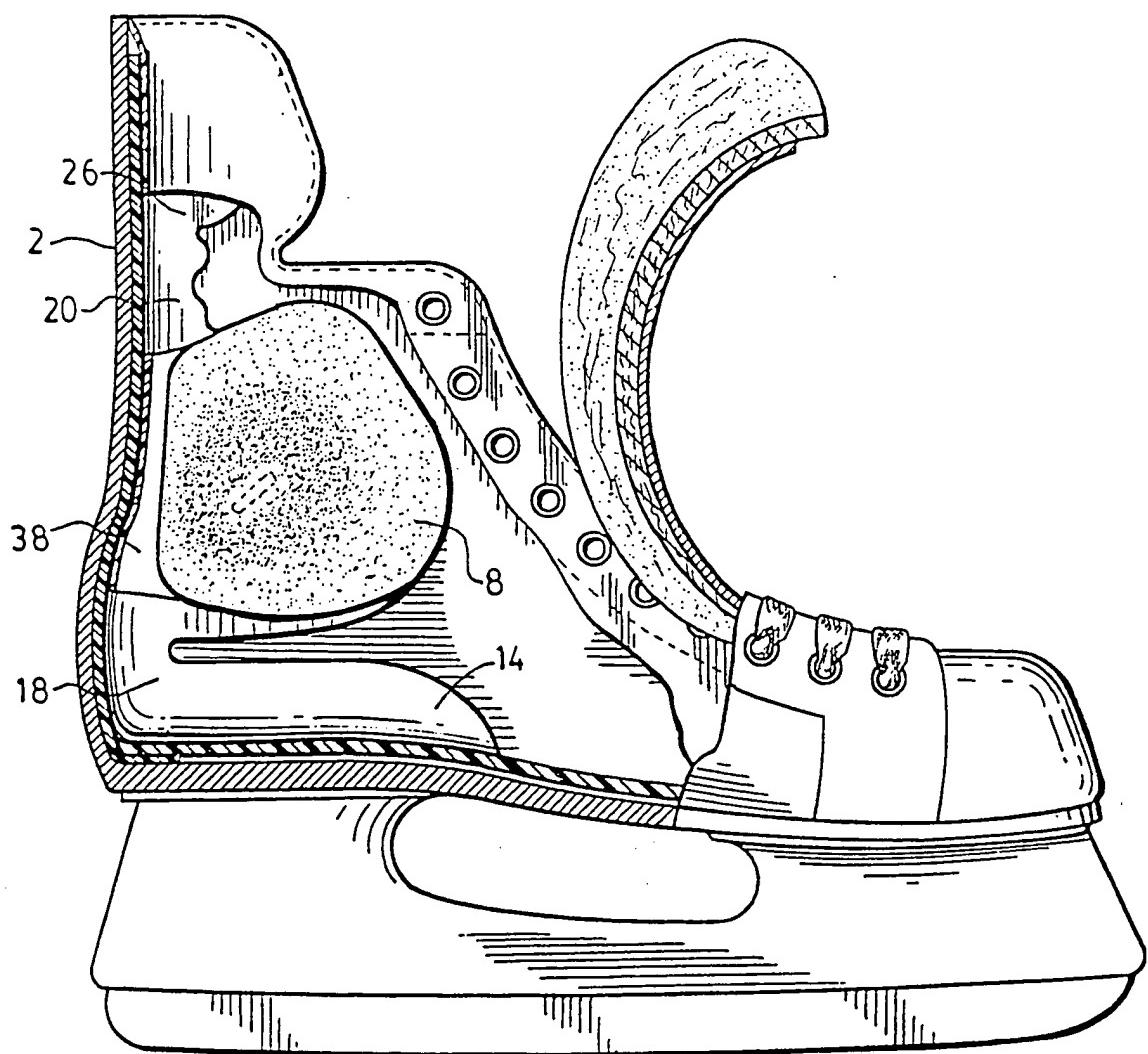


FIG.6.

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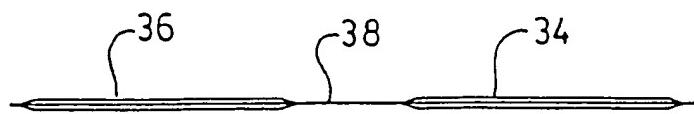


FIG.7.

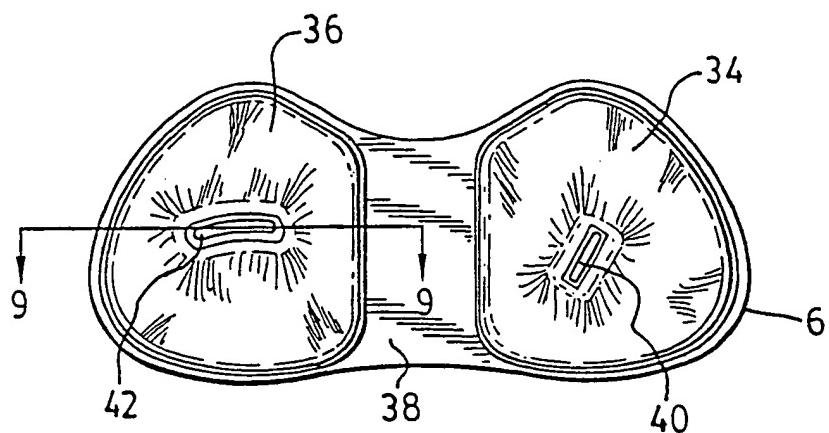


FIG.8.

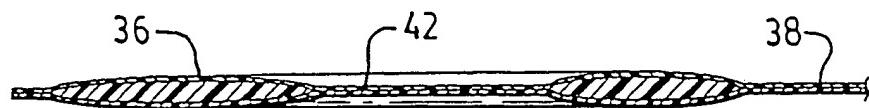


FIG.9.

# INTERNATIONAL SEARCH REPORT

Internat'l Application No  
PCT/CA 94/00661

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 6 A43B5/16 A43B5/04 A43B23/17

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 6 A43B

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US,A,4 385 456 (LIVERNOIS ET AL.) 31 May 1983 see the whole document ---	1-4,6,7
Y	GB,A,1 106 958 (ROSEMOUNT ENGINEERING COMPANY) 20 March 1968 see page 4, line 5 - line 16 ---	1-4,6,7
A	WO,A,89 09552 (LAKIC) 19 October 1989 see page 9, line 12 - line 17; figures 1,2,29 ---	4,7
A	EP,A,0 117 372 (WARRINGTON INC.) 5 September 1984 see page 9, line 1 - line 5 ---	1,6
		-/-

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Date of the actual completion of the international search

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Date of mailing of the international search report

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP,A,0 389 215 (NIKE INTERNATIONAL LTD) 26 September 1990 see column 10, line 12 - column 12, line 51; figures 1,3,4,6,16-21 ---	1-8
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